

### Overview

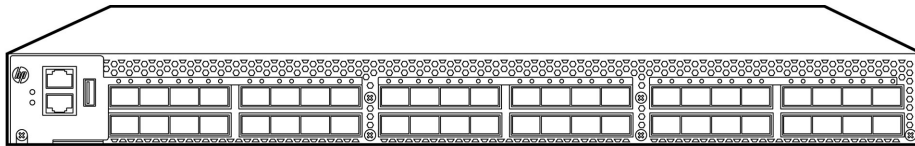
To remain competitive, IT organizations must keep pace with ever-increasing workloads without a similar increase in their budgets or resources. While virtualization has provided some relief by enabling the benefits of faster deployment and consolidation, it also tends to put additional stress on data center networks. In addition, the move toward cloud computing, which promises greater efficiency and a more service-oriented business model, means that these networks will face even greater demands.

The HP SN6000B Fibre Channel Switch meets the demands of hyper-scale, private cloud storage environments by delivering market-leading 16 Gb Fibre Channel technology and capabilities that support highly virtualized environments. Designed to enable maximum flexibility and investment protection, the SN6000B Switch is configurable in 24, 36, or 48 ports and supports 4, 8, 10, or 16 Gbps speeds in an efficiently designed 1U package. It also provides a simplified deployment process and a point-and-click user interface-making it both powerful and easy to use. The SN6000B Switch offers low-cost access to industry-leading Storage Area Network (SAN) technology while providing "pay-as-you-grow" scalability to meet the needs of an evolving storage environment.

The SN6000B is available in four models:

- HP SN6000B 16Gb 48-port/48-port Active Power Pack+ Fibre Channel Switch
- HP SN6000B 16Gb 48-port/24-port Active Power Pack+ Fibre Channel Switch
- HP SN6000B 16Gb 48-port/48-port Active Fibre Channel Switch
- HP SN6000B 16Gb 48-port/24-port Active Fibre Channel Switch

Power Pack+ includes additional software: Adaptive Networking, Fabric Watch, ISL Trunking, Extended Fabric, Performance Monitor, and Server Application Optimization. Power Pack+ software provides the SAN administrator with the necessary tools to monitor the health and performance of the network, while also ensuring the highest levels of security, scalability and manageability.



### *Features and Benefits*

#### Key Features and Benefits

- Delivers 16 Gbps performance with up to 48 ports in an energy-efficient, 1U form factor, providing maximum flexibility for diverse deployment and cooling strategies
- Features Ports on Demand (PoD) capabilities for fast, easy, and cost-effective scaling from 24 to 48 ports in 12-port increments
- Provides a flexible, simple, and easy-to-use SAN solution with industry-leading technology
- Supports highly virtualized, private cloud storage with multi-tenancy and non-stop operations
- Offers best-in-class port density and scalability for midrange enterprise SAN switches, along with redundant, hot-pluggable components and non-disruptive software upgrades
- Metro cloud connectivity features including integrated DWDM and dark fiber support (optional license)
- In-flight compression and encryption included providing efficient link utilization and security.
- Yields exceptional price/performance value, exceeding comparable Ethernet storage-based alternatives



Models

HP SN6000B 16Gb FC Switch Models	HP SN6000B 16Gb 48-port/48-port Active Power Pack+ Fibre Channel Switch	QR481A
	HP SN6000B 16Gb 48-port/24-port Active Power Pack+ Fibre Channel Switch	QK754A
	HP SN6000B 16Gb 48-port/48-port Active Fibre Channel Switch	QR480A
	HP SN6000B 16Gb 48-port/24-port Active Fibre Channel Switch	QK753A



### Product Highlights

#### SN6000B 16Gb FC Switch

- Simplifies enterprise SAN deployment by combining higher edge switch port density with exceptional scalability, performance and reliability
- Delivers 24, 36, or 48-ports in a 1U enclosure
- Provides 4 Gb/s, 8 Gb/s, 10 Gb/s, 16 Gb/s\* performance
- Employs optional Inter-Switch Link (ISL) Trunking to provide a high-speed data path between switches which enables a high speed data path between 16 Gb/s switches up to 128 Gb/s

\* 16 Gb/s ISL performance can be obtained between two 16 Gb/s switches.

---

#### Configuration Support

<http://h18000.www1.hp.com/products/storageworks/san/documentation.html>

---

#### High-availability features

- Two integrated redundant, hot swappable power supplies with integrated cooling fans
- Enhanced Fault Detection Logic
- Parity protection on all data paths and system memory

---

#### Advanced Fabric Services

- Hardware Enforced Zoning
- Frame Filtering
- Built-in Web browser management tools
- Enhanced Group Management (EGM)
- HP B-series SAN Network Advisor software (optional)

---

#### Cabinet Support

- HP (22U, 36U and 42U) 9000 and 10000 G1 Series, (25U, 33U and 41U) HP System/e, and the 22U, 36U, and 42U HP 10000 G2 Series
- NOTE:** To order factory integration, add 0D1 after the part number on your sales order.

---

### Software Components, Standard, Base Models

#### Frame Filtering

An ASIC based capability that enables new applications and features. The switch has the ability to "view" the first 64 bytes of the Fibre Channel frame. At this time, Frame Filtering enables advanced capabilities such as Advanced Zoning and Advanced Performance Monitoring.

---

#### Advanced Zoning

WWN Zoning and Access Control are enforced by hardware that provides the same simple administration previously enforced only with software. Administrators can organize a physical fabric into logical groups and prevent unauthorized access by devices outside the Zone.

---

#### Web Tools

Web Tools is an intuitive and easy-to-use graphical interface that enables organizations to monitor and manage SAN fabrics. Tasks can be performed through a Java-capable Web browser from a standard laptop, desktop PC or workstation from any location within the enterprise.

---



### Product Highlights

#### EGM

Enhanced Group Management (EGM) is a FOS license that is included with all B-Series switches and enables multi-switch operations. It helps automate operations across multiple switches to save time and streamline repetitive operations, which are typically prone to error. EGM drives consistency across fabrics, while minimizing the risk associated with potential downtime due to configuration mismatches. EGM provides streamlined troubleshooting for more effective fabric monitoring and diagnosis.

HP SAN Network Advisor Professional, Professional Plus, and Enterprise enable EGM functionality. Customers have EGM functionality enabled within the hardware product and need only to make the decision around which management application is right for them.

#### In-flight Compression and Encryption

In-flight compression optimizes network performance within the data center and over long-distance links. Data is compressed at the source and uncompressed at the destination. Performance varies by data type, but generally achieve 2:1 compression with minimal impact on performance. Compression can be used in conjunction with in-flight encryption.

In-flight encryption minimizes the risk of unauthorized access for traffic within the data center and over long-distance links. It is switch-to-switch encryption, not device or data-at-rest encryption. Data is encrypted at the source and decrypted at the destination. Encryption and decryption are performed in hardware using the AES-GCM-256 algorithm, minimizing any impact on performance. Encryption can be used in conjunction with in-flight compression. This is complementary to data-at-rest encryption provided by the Encryption SAN Switch and the Encryption Blade for B-series SAN Directors.

### Software Components, Optional

#### SN6000B 16Gb Switch Power Pack+ Software Bundle

The Power Pack+ Software Bundle comes with the SN6000B16Gb 48/48 Power Pack+ Switch and SN6000B 16Gb 48/24 Power Pack+ Switch or as an optional software bundle for the SN6000B 16Gb 48/48 FC Switch and SN6000B 48/24 FC Switch. It includes the following:

- Adaptive Networking
- Fabric Watch
- Advanced Performance Monitor
- Extended Fabric
- ISL Trunking
- Server Application Optimization



### Product Highlights

#### Adaptive Networking

Adaptive Networking (AN) is an optional family of technologies which allow flexible control of traffic movement within the fabric which deliver application aware management of fabric resources. Applications may be used with multiple protocols and multiple classes of service. It includes the following features:

##### Ingress Rate Limiting:

Allows the ingress bandwidth of a port to be throttled to a rate lower than negotiated with the SAN node. This could be very useful for enterprises offering stepped levels of service and enforcing SLAs.

##### Quality of Service (QoS):

Enables zones with high, medium, and low priorities within a fabric on a zone by zone basis. This can be very useful for prioritizing array replication over MANs and WANs over less critical traffic.

##### Traffic Isolation Zones:

Defines paths through a fabric for some or all nodes. Failover allows a non-preferred path to be used if the preferred fails. TIZs use failover by default but it can be disabled if traffic should stop if a preferred path fails. TIZ can be used to manually map out traffic flows within a fabric based on application, priority, and topology.

---

#### Fabric Watch

Fabric Watch is an optional license which enables each switch to monitor the SAN for potential faults and automatically alert network managers to problems before they become failures. Fabric Watch tracks a variety of SAN fabric elements, events, and counters. Monitoring fabric-wide events, ports, SFPs, and environmental parameters permits early fault detection and isolation as well as performance measurement. Each switch in the SAN needs its own Fabric Watch license.

---

#### Advanced Performance Monitor

This optional enabling technology helps administrators monitor and watch specific fabric metrics -- from a SID (Source ID) to a DID (Destination ID) -- so they can fine-tune and scale the fabric more efficiently. Plus, Advanced Performance Monitoring includes the ability for early warning detection of hot spots within the fabric, a powerful tool for maintaining overall balanced performance.

Top Talkers is a component of Advanced Performance Monitoring and tracks the top traffic flows for hosts and targets for a switch port or a switch. Top Talkers can help identify the ports that need certain Quality of Service (QoS) attributes or it can help determine portions of the physical topology that need reconfiguration.

---

#### Extended Fabric

Optional license which extends all of the scalability, reliability, and performance benefits of Fibre Channel Storage Area Networks (SANs) beyond the native 10 km distance specified by the Fibre Channel standard.

---



### Product Highlights

#### ISL Trunking

For high performance enhanced Trunking, this optional license logically groups up to eight E-ports to provide a high bandwidth trunk between two switches. Each 16Gb switch needs its own license. The switch operating system views the trunk as a single, high bandwidth resource (up to 128Gb) when routing connections between 16Gb switches. Connections are load-balanced across the individual links, which comprise the logical trunk group.

#### Server Application Optimization

Server Application Optimization (SAO) license improves overall application performance for physical servers and virtual machines. SAO, when deployed with B-Series Fibre Channel HBAs, extends B-Series Adaptive Networking from the B-series SAN fabric to the server infrastructure. This delivers application-level, fine-grain Quality of Service (QoS) management to the HBAs and related server applications.

Solution Requirements:

- SAO license must be installed on the edge (server connected) switch
- Adaptive Networking (AN) license must be installed on the edge (server connected) switch
- SAO requires B-series HBA installed in the server

#### Integrated Fibre Channel Extension

Integrated SAN extension over native Fibre Channel provide metro connections up to 100 km including support for 10 Gbps Fibre Channel over Dense Wavelength Division Multiplexing (DWDM) and dark fiber. This license enables support on the first eight (8) ports of the switch.

#### SAN Network Advisor Professional

HP SAN Network Advisor Professional is a server based management application available at no-charge that comes with B-series SAN Switches and includes the following features:

- Allows management of a single Fabric OS (FOS) fabric (up to a 1,000 B-Series switch ports)
- Performs group switch management beyond the scope of Web Tools
- Does not offer management for the DC SAN Backbone Director, the SN8000B Director, or FICON

It is targeted for SMB customers that use FOS based SAN fabrics and require a management solution for smaller SANs based on a single fabric.

SMB customers that initially start off with SAN Network Advisor Professional and have a small SAN environment may over time feel the need for an enterprise-class product (SAN Network Advisor Enterprise) as their environments start to grow in size and complexity, and as they start to uptake more enterprise-class functionality (such as Fibre Channel Routing, FCIP, etc.). A non-disruptive upgrade path is available from SAN Network Advisor Professional to SAN Network Advisor Enterprise.

#### SAN Network Advisor Enterprise and Professional+

HP SAN Network Advisor Enterprise and Professional+ are the enterprise-class products that support FOS products. SAN Network Advisor Enterprise provides complete B-series Directors Management including enterprise-class features/environments such as FICON, Fibre Channel Routing, FCIP, adaptive networking, etc while SAN Network Advisor Professional+ provides the same feature set except for support for the DC SAN Backbone Director, SN8000B 8-Slot Director, and FICON.

SAN Network Advisor Enterprise delivers unprecedented scalability, up to 24 fabrics and 9,000 switch ports, while SAN Network Advisor Professional+ scales to 4 SAN Fabrics and 2560 switch ports. There is an upgrade available from SAN Network Advisor Professional Plus to SAN Network Advisor Enterprise.



### *Product Highlights*

#### **Integrated Routing**

Integrated Routing is an optional license which provides native Fibre Channel Routing (FCR) on a per-port basis, rather than limiting routing ports to those on a dedicated routing switch or blade. Just like traditional FCR, Integrated Routing uses EX\_Ports to import/export devices between fabrics, enabling selective device sharing while maintaining remote fabric isolation. Integrated Routing provides architecture flexibility to route on a port-by-port basis, enabling increased scalability and fault isolation.





### Service and Support

#### Warranty

(1-1-1) Hardware Warranty; 1-year parts; 1-year on-site (standard business hours, next business day response) and 1-year labor.

**NOTE:** The hardware warranty covers firmware and embedded non-saleable software. For extended hardware installation and maintenance information, click the link below:

<http://www.hp.com/hps/carepack/services/>.

**NOTE:** Certain restrictions and exclusions apply. Consult the Customer Support Center for details. Hardware or Software product installation is not included in the warranty, but is available and highly recommended.

#### Service and Support

##### Technology Services for increased uptime, productivity and ROI

TRUST HP storage technology experts for every level of service and support. Our integrated portfolio of Services for storage help customers reduce costs, optimize data, streamline storage management, and improve backup and recovery. Capitalizing on HP Storage Systems' capabilities requires a service partner who understands your increasingly complex environment. Team with the people who know HP infrastructure hardware and software best-the experienced professionals at HP Services.

##### Protect your business beyond warranty

Warranty protects against manufacturer defects, however warranty uplifts, such as HP Care Pack Services protect the business-by reducing downtime risks and providing operational consistency for mission-critical and standard business computing.

##### What HP Storage Technology Services can do for you

HP Storage Technology Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. HP storage lifecycle support services offers a full spectrum of customer care-from technology support to complex migrations to complete managed services.

##### Choose the right level of support, deployment and integration services

HP support recommendations are designed to help you enhance technology operations and lower risk-and make it easier for you to seek the right balance between affordability and service-level commitments. Depending on your individual support needs, choose from three levels of care that cover the entire lifecycle to better address your needs-Optimized Care, Standard Care, and Basic Care. If none of our support recommendations meet your needs, we can tailor a service solution for your unique support requirements. Only HP brings together deep expertise, proactive and business critical support and a strong partner network-plus, a full set of infrastructure services designed to power a Converged Infrastructure.



### Service and Support

#### Optimized Care - delivers

Choose either:  
best performance and  
stability through  
deployment and proactive  
management practices

**HP Critical Advantage Level 3 Service** - Choose this service when you need an end-to-end infrastructure support solution that encompasses server, operating system, hypervisor, storage, and network. It's the level of support well suited for business-critical applications running on virtualized and x86 infrastructures. (Includes 60 Critical Advantage flexible credits.)

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-1772ENW.pdf>

Or:

**3-Year HP Critical Service** - Designed for environments where downtime cannot be tolerated, HP monitors your environment around-the-clock, 365 days a year. We implement improvement projects to mitigate risks and reduce incidents. If outages do occur, they are addressed immediately with access to our dedicated critical support escalation resources.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA0-1613ENW.pdf>

---

#### Standard Care -

maintains high level of  
uptime, along with expert  
help to cut the cost and  
complexity of  
implementation and  
support

Choose either:

**HP Critical Advantage Level 2 Service** - Opt for end-to-end infrastructure support including server, operating system, hypervisor, storage, and network in an environment running business critical applications on virtualized and x86 infrastructures. (Includes 30 Critical Advantage flexible credits.)

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-1772ENW.pdf>

Or:

**3-Year HP Proactive 24 Service** - This is the right choice for environments where some downtime is acceptable. HP helps manage your IT environment for improved performance, stability, and availability. Your incidents are addressed 24x7, with a maximum 4-hour onsite response 365 days a year.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9842EN.pdf>

Plus:

**HP Proactive Select** - Choose from an extensive menu of consultancy and technical services, such as onsite firmware upgrades, health checks, assessments, and education. (Includes 30 Proactive Select flexible credits.)

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENW.pdf>

---

**Basic Care** - Minimum  
recommended support

**3-Year HP Proactive 24 Service** - This is the right choice for environments where some downtime is acceptable. HP helps manage your IT environment for improved performance, stability, and availability. Your incidents are addressed 24x7, with a maximum 4-hour onsite response 365 days a year.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9842EN.pdf>

---

**Implement right from the  
start**

**Whichever level of care you select, it includes:**

HP Enhanced Implementation Service for SANs-HP delivers complete design and implementation services for Fibre Channel, FCoE, FCIP, SAS, and iSCSI SAN connectivity components.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-8527EN.pdf>



### Service and Support

#### Remote Support Tools

**HP Insight Remote Support** - Count on proven technology to deliver secure, reliable 24x7 remote monitoring, diagnosis, and problem resolution, all available at no extra charge if you have an existing warranty, service agreement, or HP Care Pack Service with HP.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-4676ENW.pdf>

#### Additional service to meet your needs

**HP Assessment Service for SANs** - We offer customized technical and operational guidance to customers employing HP storage subsystems and the interconnecting storage area network (SAN), with recommendations to help improve availability levels and ongoing environment management.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA1-2941ENW.pdf>

#### For more information

[www.hp.com/services/storage](http://www.hp.com/services/storage)

To learn more on HP Storage Services, please contact your HP sales representative or HP Authorized Channel Partner

HP Care Pack Services are sold by HP and HP Authorized Service Partners:

- Services for customers purchasing from HP or an enterprise reseller are quoted using HP order configuration tools.
- Customers purchasing from a commercial reseller can find HP Care Pack Services at [www.hp.com/go/lookuptool](http://www.hp.com/go/lookuptool)



### Family Information

Features	8/8 SAN Switch Base and 8/8 SAN Switch	8/24 SAN Switch Base	8/40 SAN Switch and 8/40 SAN Switch Power Pack+	8/80 SAN Switch and 8/80 SAN Switch Power Pack+	SN6000B 16Gb FC Switch and SN6000B 16Gb FC Power Pack+
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments	Workgroups, Departments
Fibre Channel Port Bandwidth	8Gbit/sec	8Gbit/sec	8Gbit/sec	8Gbit/sec	16Gbit/sec
Aggregate device bandwidth	128 - 384 Gbit/sec end-to-end	256 - 384 Gbit/sec end-to-end	384 - 640 Gbit/sec end-to-end	768 - 1280 Gbit/sec end-to-end	768 - 1536 Gbit/sec end-to-end
OS Support	<b>NOTE:</b> Please Refer to SAN Design Guide <a href="http://www.hp.com/go/sandesign">http://www.hp.com/go/sandesign</a> or <a href="http://www.hp.com/go/sandesignguide">http://www.hp.com/go/sandesignguide</a>				
Storage system support	P9000/XP, 3PAR, P6000/EVA, P2000/MSA				
FC Ports	8 Enabled 24 Max	16 Enabled 24 Max	24 Enabled 40 Max	48 Enabled 80 Max	24 or 48 Enabled 48 Max
SFP	B-series	B-series	B-series	B-series	B-series
Advanced Trunking	Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade
Adaptive Networking	Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade
Form factor	1U	1U	1U	2U	1U
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	No	No	Yes	Yes	Yes
Hot plug fans	No	No	Yes	Yes	Yes (integrated with power supply)



### Family Information

Features	2408 FCoE CN Switch and 2408 FCoE CN Switch Power Pack+	1606 Extension SAN Switch	Encryption SAN Switch
Targeted Environment	Workgroups, Departments	Data Centers	Data Centers
Fibre Channel Port Bandwidth	8Gbit/sec	8Gbit/sec	8Gbit/sec
Ethernet	10Gbit/sec Converged Enhanced Ethernet	1Gbit/sec Ethernet	N/A
Aggregate device bandwidth			512 Gbit/sec end-to-end
OS Support	<b>NOTE:</b> Please Refer to SAN Design Guide <a href="http://www.hp.com/go/sandesign">http://www.hp.com/go/sandesign</a> or <a href="http://www.hp.com/go/sandesignguide">http://www.hp.com/go/sandesignguide</a>		
Storage system support	P9000/XP, 3PAR, P6000/EVA, P2000/MSA		
FC Ports	8 Enabled 8 Max	4 or 16 Enabled 16 Max	32 Enabled 32 Max
Ethernet Ports	24 Enabled 24 Max	2 or 6 Enabled 6 Max	N/A
SFP	B-series	B-series	B-series
Advanced Trunking	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Optional Upgrade
Adaptive Networking	No	Included with Power Pack+ or Optional Upgrade	Optional Upgrade
Form factor	1U	1U	2U
Zoning Software	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	Yes	Yes	Yes
Hot plug fans	Yes	Yes	

Features	SN8000B 8-Slot SAN Director Power Pack+	SN8000B 4-Slot SAN Director and 4-Slot SAN Director Power Pack+	DC SAN Backbone Director Power Pack+	DC04 SAN Director and DC04 SAN Director Power Pack+
Targeted Environment	Cloud Optimized Data Centers	Cloud Optimized Data Centers	Traditional Data Centers	Traditional Data Centers
Port Bandwidth	Up to 16Gbit/sec	Up to 16Gbit/sec	8Gbit/sec	8Gbit/sec
Aggregate device bandwidth	8.2 Tbit/sec end-to-end	4.1 Tbit/sec end-to-end	4.1 Tbit/sec end-to-end	2 Tbit/sec end-to-end
OS Support	<b>NOTE:</b> Please Refer to SAN Design Guide <a href="http://www.hp.com/go/sandesign">http://www.hp.com/go/sandesign</a> or <a href="http://www.hp.com/go/sandesignguide">http://www.hp.com/go/sandesignguide</a>			
Storage system support	P9000/XP, 3PAR, P6000/EVA, P2000/MSA			
Ports	Up to 512 SFP	Up to 256 SFP	Up to 512	Up to 256
SFP	B-series	B-series	B-series	B-series



### Family Information

Advanced Trunking	Included with Power Pack	Included with Power Pack or Optional Upgrade	Included with Power Pack+	Included with Power Pack+ or Optional
Adaptive Networking	Included with Power Pack	Included with Power Pack or Optional Upgrade	Included with Power Pack+	Included with Power Pack+ or Optional
Form factor	14U	9U	14U	9U
Zoning Software	Yes (included)	Yes (included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	Yes	Yes	Yes	Yes
Hot plug fans	Yes	Yes	Yes	Yes

Features	Embedded SAN Switch for EVA4400	Brocade 8Gb SAN Switch for HP c-Class BladeSystem	B-Series Multi-protocol Router Blade	B-Series Multi-protocol Extension Blade
Targeted Environment	Workgroups, Departments	Workgroups, Departments	Data Centers	Data Centers
Port Bandwidth	8Gbit/sec	8Gbit/sec	4 Gbit/sec FC Ethernet: 1 Gbit/sec	8 Gbit/sec FC Ethernet: 1 or 10 Gbit/sec
Aggregate device bandwidth	320 Gbit/sec end-to-end	384 Gbit/sec end-to-end	N/A	N/A
OS Support	<b>NOTE: Please Refer to SAN Design Guide</b> <a href="http://www.hp.com/go/sandesign">http://www.hp.com/go/sandesign</a> or <a href="http://www.hp.com/go/sandesignguide">http://www.hp.com/go/sandesignguide</a>			
Storage system Support	P9000/XP, 3PAR, P6000/EVA, P2000/MSA			
Ports	20 external per EVA Controller Pair	4 or 8 external / 8 or 16 internal	18 ports: 16 FC and 2 Gigabit Ethernet	16 8Gb FC and 10 1GbE or 2 10GbE
SFP	B-series	B-series	HP	B-series
Advanced Trunking	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Optional Upgrade to chassis	Optional Upgrade to chassis
Adaptive Networking	Included with Power Pack+ or Optional Upgrade	Included with Power Pack+ or Optional Upgrade	Optional Upgrade to chassis	Optional Upgrade to chassis
Form factor	Embedded	Embedded	Blade in 4/256, DC SAN Back, or DC04 SAN Dir	Blade in SN8000B and DC SAN Directors
Zoning Software	Embedded	Yes (Included)	Yes (Included)	Yes (Included)
Hot plug, redundant power supplies	Yes, in EVA 4400 Enclosure	Yes, in BladeSystem Enclosure	Yes, in director chassis	Yes, in director chassis
Hot plug fans	Yes, in EVA 4400 Enclosure	Yes, in BladeSystem Enclosure	Yes, in director chassis	Yes, in director chassis



### Configuration Information

#### Step 1 - Base Configuration

Select one:

Model	Model Description	Part Number
SN6000B 16Gb 48/48 Power Pack+ FC Switch	16Gb 48/48 FC Switch with 48 active ports; rackmount kit; accessory kit (enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools, Advanced Zoning, SAN Network Advisor Professional, Brocade EZ Switch, and Power Pack+ software of Adaptive Networking, ISL Trunking, Extended Fabric, Advanced Performance Monitoring, Server Application Optimization, and Fabric Watch. <b>NOTE:</b> Requires optical transceivers listed below.	QR481A
SN6000B 16Gb 48/24 Power Pack+ FC Switch	16Gb 48/48 FC Switch with 24 active ports; rackmount kit; accessory kit (enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools, Advanced Zoning, SAN Network Advisor Professional, Brocade EZ Switch, and Power Pack+ software of Adaptive Networking, ISL Trunking, Extended Fabric, Advanced Performance Monitoring, Server Application Optimization, and Fabric Watch. <b>NOTE:</b> Requires optical transceivers listed below.	QK754A
SN6000B 16Gb 48/48 FC Switch	16Gb 48/48 FC Switch with 48 active ports; rackmount kit; accessory kit (enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools, Brocade EZ Switch, Advanced Zoning, and SAN Network Advisor Professional. <b>NOTE:</b> Requires optical transceivers listed below.	QR480A
SN6000B 16Gb 48/24 FC Switch	16Gb 48/48 FC Switch with 24 active ports; rackmount kit; accessory kit (enterprise safety and regulatory information, installation guide, rack-mounting instructions), power cords, serial cable, base software of Advanced Fabric OS, Advanced Web Tools, Brocade EZ Switch, Advanced Zoning, and SAN Network Advisor Professional. <b>NOTE:</b> Requires optical transceivers listed below.	QK753A
SN6000B 16Gb 24-48 12-port FC Upgrade LTU	12 port upgrade license for SN6000B 16Gb 48/24 Power Pack FC Switch (QK754A) and SN6000B 16Gb 48/24 FC Switch (QK753A)	TC356A

#### Step 2 - Options

Select each type of required options with quantities specified:

	Model Description	Part Number
Fibre Channel Transceivers	HP 16Gb Short Wave B-series SFP+ 1 Pack	QK724A
	HP 8Gb Short Wave B-series FC SFP+ 1 Pack	AJ716B*
	<b>*NOTE:</b> AJ716A is not supported with the SN6000B 16Gb FC Switch	



### Configuration Information

Distance - Maximum	HP Standard OM2 Cable	HP Standard OM3 Cable	HP PremierFlex OM3+ Cable	HP PremierFlex OM4 Cable
16Gb performance:	35 meters	100 meters	100 meters	125 meters
8Gb performance:	50 meters	150 meters	150 meters	190 meters
4Gb performance:	150 meters	380 meters	380 meters	400 meters

HP 16Gb Long Wave B-series 10km FC SFP+ 1 Pack

QK725A

HP 8Gb Long Wave B-series 10km FC SFP+ 1 Pack

AJ717A

HP 8Gb Long Wave B-Series 25km FC SFP+ 1 Pack

AW538A

HP B-series 10Gb SFP+ Short Range Transceiver

QK726A

HP B-series 10Gb SFP+ Long Range Transceiver

QK727A

2Gb USB Device

AK864A

#### USB

#### Optical Cables

##### HP PremierFlex OM4+ Fiber Optic Cables

1m HP PremierFlex OM4 LC/LC Multi-mode Optical Cable

QK732A

2m HP PremierFlex OM4 LC/LC Multi-mode Optical Cable

QK733A

5m HP PremierFlex OM4 LC/LC Multi-mode Optical Cable

QK734A

15m HP PremierFlex OM4 LC/LC Multi-mode Optical Cable

QK735A

30m HP PremierFlex OM4 LC/LC Multi-mode Optical Cable

QK736A

50m HP PremierFlex OM4 LC/LC Multi-mode Optical Cable

QK737A

##### HP PremierFlex OM3+ Optical Cables

.5m HP PremierFlex OM3+ LC/LC Multi-Mode Optical Cable

BK837A

1m HP PremierFlex OM3+ LC/LC Multi-mode Optical Cable

BK838A

2m HP PremierFlex OM3+ LC/LC Multi-mode Optical Cable

BK839A

5m HP PremierFlex OM3+ LC/LC Multi-mode Optical Cable

BK840A

15m HP PremierFlex OM3+ LC/LC Multi-mode Optical Cable

BK841A

30m HP PremierFlex OM3+ LC/LC Multi-mode Optical Cable

BK842A

50m HP PremierFlex OM3+ LC/LC Multi-mode Optical Cable

BK843A

##### HP OM3 LC-LC Optical Cables

.5m HP OM3 LC/LC Multi-mode Optical Cable

AJ833A

1m HP OM3 LC/LC Multi-mode Optical Cable

AJ834A

2m HP OM3 LC-LC Multi-mode Optical Cable

AJ835A

5m HP OM3 LC-LC Multi-mode OM3 Optical Cable

AJ836A

15m HP OM3 LC-LC Multi-mode OM3 Optical Cable

AJ837A

30m HP OM3 LC-LC Multi-mode OM3 Optical Cable

AJ838A

50 m HP OM3 LC-LC Multi-mode OM3 Optical Cable

AJ839A





### Configuration Information

#### Step 3 - Optional Software\*

\* For Fabric OS (FOS) minimum requirements, please refer to: <http://spock.corp.hp.com/>

Software for SN6000B 16Gb FC Switch	SAN Network Advisor Enterprise Software	TC352A
	SAN Network Advisor Professional Plus Software	TC353A
	SAN Network Advisor Professional Plus Upgrade Software	TC354A
	Power Pack+ Upgrade Software	T5522A
	<b>NOTE:</b> The Power Pack+ Software Bundle kit includes Adaptive Networking, Fabric Watch, ISL Trunking, Extended Fabric, Server Application Optimization, and Advanced Performance Monitor.	
	Extended Fabric	313458-B21
	Fabric Watch	313454-B21
	Advanced Performance Monitor	313450-B21
	ISL Trunking	313452-B21
	HP SN6000B 10Gb Integrated FC Extension (enables 10Gb FC for first eight ports)	TC358A
	Integrated Routing	T5528A



### Technical Specifications

System Architecture	Fibre Channel ports	Switch mode (default): 24-, 36-, and 48-port configurations (12-port increments through Ports on Demand [PoD] licenses); universal (E, F, M, D, EX) ports
	Scalability	Full fabric architecture: <a href="http://h18006.www1.hp.com/products/storageworks/san/documentation.html">http://h18006.www1.hp.com/products/storageworks/san/documentation.html</a>
	Certified maximum	Refer to SAN Design Guide for current configuration information: <a href="http://h18006.www1.hp.com/products/storageworks/san/documentation.html">http://h18006.www1.hp.com/products/storageworks/san/documentation.html</a>
	Interoperability	<ul style="list-style-type: none"><li>● 4/256 SAN Director</li><li>● 4/64 SAN Switch</li><li>● 4/32 SAN Switch</li><li>● 4/32B SAN Switch</li><li>● 4/8 SAN Switch</li><li>● 4/16 SAN Switch</li><li>● 8/8 SAN Switch</li><li>● 8/24 SAN Switch</li><li>● 8/40 SAN Switch</li><li>● 8/80 SAN Switch</li><li>● Encryption SAN Switch</li><li>● 2408 FCoE Converged Network Switch</li><li>● 1606 Extension SAN Switch</li><li>● DC04 SAN Director</li><li>● DC SAN Backbone Director</li><li>● SN8000B 8-Slot SAN Backbone Director</li><li>● SN8000B 4-Slot SAN Director</li><li>● Brocade 4Gb SAN Switch for HP c-Class BladeSystem</li><li>● Brocade 8Gb SAN Switch for HP BladeSystem c-Class</li><li>● HP 400 MP-Router</li></ul>
	Performance	Auto-sensing of 4, 8, and 16 Gbps port speeds; 10 Gbps and optionally programmable to fixed port speed.
	ISL Trunking	Frame-based trunking with up to eight 16 Gbps ports per ISL trunk; up to 128 Gbps per ISL trunk. Exchange-based load balancing across ISLs with DPS included in Fabric OS. There is no limit to how many trunk groups can be configured in the switch.
	Aggregate bandwidth	1536 Gbit/sec full duplex
	Fabric latency	Latency for locally switched ports is 700 ns; encryption/compression is 5.5 sec per node; Forward Error Correction (FEC) adds 400 ns between E_Ports (enabled by default).
	Maximum frame size	2112-byte payload
	Classes of service	Class 2, Class 3, Class F (inter-switch frames)
	Port types	D_Port (Diagnostic Port), E_Port, EX_Port, F_Port, M_Port (Mirror Port); self-discovery based on switch type (U_Port); optional port type control Access Gateway mode: F_Port and NPIV-enabled N_Port
	Data traffic types	Fabric switches supporting unicast



### Technical Specifications

Management	Media types	Hot-pluggable, B-Series Branded Small Form Factor Pluggable (SFP), LC connector; Short-Wave Laser (SWL), Long-Wave Laser (LWL); distance depends on fiber-optic cable and port speed. Supports SFP+ (16/10/8 Gbit/sec) optical transceivers.
	USB	One USB port for system log file downloads or firmware upgrades
	Fabric services	Advanced Performance Monitoring (APM) (including Top Talkers for E_Ports, F_Ports, and Fabric mode); Adaptive Networking (Ingress Rate Limiting, Traffic Isolation, QoS); Bottleneck Detection; Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning); Dynamic Fabric Provisioning (DFP); Dynamic Path Selection (DPS); Extended Fabrics; Enhanced BB credit recovery; Brocade Fabric Watch; FDMI; Frame Redirection; Frame-based Trunking; FSPF; Integrated Routing; IPoFC; ISL Trunking; Management Server; NPIV; NTP v3; Port Fencing; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Server Application Optimization (SAO); Simple Name Server (SNS); Virtual Fabrics (Logical Switch, Logical Fabric)
	Extension	Fibre Channel, in-flight compression (Brocade LZO) and encryption (AES-GCM-256); integrated 10 Gbps Fibre Channel for DWDM MAN connectivity
	Options	SFP media, USB Device
	Management software supported	HTTP, SNMP v1/v3 (FE MIB, FC Management MIB), SSH; Auditing, Syslog; Brocade Advanced Web Tools, APM, Fabric Watch; SAN Network Advisor Enterprise or SAN Network Advisor Professional/Professional Plus; Command Line Interface (CLI); SMI-S compliant; Administrative Domains; trial licenses for add-on capabilities
	Management access	10/100 Mbps Ethernet (RJ-45), in-band over Fibre Channel, serial port (RJ-45), and one USB port
	Diagnostics	D_Port offline diagnostics, including electrical/ optical loopback, link traffic/latency/distance; POST and embedded online/offline diagnostics, including environmental monitoring, FCping and Pathinfo (FC traceroute), frame viewer, non-disruptive daemon restart port mirroring (SPAN port), optics health monitoring, power monitoring, RAStracE logging, and Rolling Reboot Detection (RRD)
	Enclosure	Back-to-front airflow; power from back; 1U
	Size	Width: 438 mm (17.23 in.) Height: 43 mm (1.7 in.) Depth: 443 mm (17.45 in.)
Mechanicals	System Weight	9.16 kg (20.20 lb) with two power supply FRUs, without transceivers
Environment	Temperature	Operating: 0° to 40° C (32° to 104° F) Non-operating: -25° to 70° C (-13° to 158° F)
	Humidity	Operating: 10 to 85 percent non-condensing
	Altitude	Operating: Up to 3000 meters (9,842 feet) Storage: Up to 12 kilometers (39,370 feet)
	Shock	Operating: 20 g, 6 ms half-sine Non-operating: Half sine, 33G 11ms. 3/eg Axis
	Vibration	Operating: 0.5 g sine, 0.4 grms random, 5 to 500 Hz Non-operating: 2.0 g sine, 1.1 grms random, 5 to 500 Hz



### Technical Specifications

Power	Power Supply	Dual, hot-swappable redundant power supplies with integrated system cooling fans
	AC input	85 V to 264 V ~5 A to 2.5 A
	Input line frequency	47 Hz to 63 Hz
	Power Consumption	110 watts with all 48 ports populated with 16 Gbps SWL optics 72 watts for empty chassis with no optics

© Copyright 2011 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

